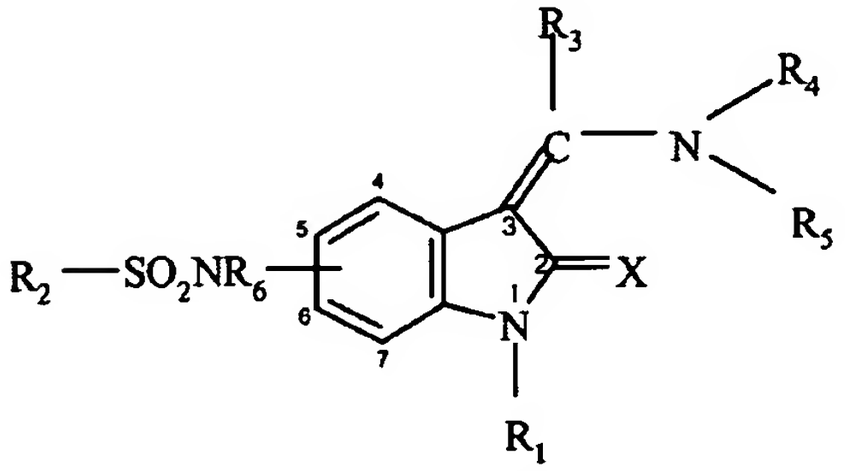
CLAIMS

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A compound of the formula I



(I),

or a pharmaceutically acceptable salt thereof, wherein:

X is an oxygen or sulphur atom,

R_1 is a hydrogen atom, a C_{1-4}-alkoxycarbonyl or C_{2-4}-alkanoyl group,

R_2 is a pyridinyl group; ~~C_{1-6}-alkyl group optionally substituted by one or more halogen atoms or a phenyl group or a C_{2-6}-alkenyl group optionally substituted by a phenyl group, wherein the phenyl moiety may be substituted in each case by a fluorine, chlorine, bromine or iodine atom, by a C_{1-3}-alkyl or C_{1-3}-alkoxy group,~~

~~a phenyl group which may be mono- or disubstituted by fluorine, chlorine, bromine or iodine atoms, by C_{1-3}-alkyl or C_{1-3}-alkoxy groups, wherein the substituents may be identical or different,~~

~~a phenyl group substituted by a trifluoromethyl, carboxy, C_{1-3}-alkoxycarbonyl, aminocarbonyl, cyano, aminomethyl, nitro or amino group,~~

~~a C_{4-6}-alkyl, C_{3-7}-cycloalkyl, trimethylphenyl or naphthyl group,~~

~~a 5-membered heteroaromatic group optionally substituted by a C_{1-3}-alkyl group, which contains, in the heteroaromatic moiety,~~
~~an imino group optionally substituted by a C_{1-3}-alkyl group, an oxygen or sulphur atom,~~
~~an imino group optionally substituted by a C_{1-3}-alkyl group and an oxygen, sulphur or nitrogen atom,~~
~~an imino group optionally substituted by a C_{1-3}-alkyl group and two nitrogen atoms, or~~
~~an oxygen or sulphur atom and two nitrogen atoms, and to which a phenyl ring may be fused via two adjacent carbon atoms,~~
~~or is a 6-membered heteroaromatic group optionally substituted by a C_{1-3}-alkyl group, which contains one or two heteroatoms in the heteroaromatic moiety and to which a phenyl ring may be fused via two adjacent carbon atoms,~~;

R_3 is a hydrogen atom or a C_{1-6}-alkyl group,
a phenyl group optionally substituted by a fluorine, chlorine or bromine atom, by a C_{1-3}-alkyl, hydroxy, C_{1-3}-alkoxy, C_{1-3}-alkylsulphenyl, C_{1-3}-alkylsulphinyl, C_{1-3}-alkylsulphonyl, phenylsulphenyl, phenylsulphinyl, phenylsulphonyl, nitro, amino, C_{1-3}-alkylamino, di-(C_{1-3}-alkyl)-amino, C_{2-5}-alkanoylamino or N-(C_{1-3}-alkylamino)-C_{2-5}-alkanoylamino group,

R4 is a phenyl or naphthyl group ~~optionally~~ substituted by R_7, which may additionally be substituted by a chlorine or bromine atom or a nitro group, ~~a 5-membered heteroaromatic group which contains an imino group, an oxygen or sulphur atom or an imino group, an oxygen or sulphur atom and one or two nitrogen atoms, or~~
~~a 6-membered heteroaromatic group which contains one, two or three nitrogen atoms, while the abovementioned 5- and 6-membered heteroaromatic groups may additionally be substituted by a chlorine or bromine atom or by a methyl group or wherein a phenyl ring may be fused to the abovementioned 5- and 6-membered heteroaromatic groups via 2 adjacent carbon atoms, or~~

R_5 and R_6 in each case independently of one another are hydrogen atoms or C_{1-3}-alkyl groups, and

R_7 is a ~~fluorine, chlorine, bromine or iodine atom or a cyano group,~~
~~a methoxy group or a C_{2-3}-alkoxy group, which may be substituted in the 2 or 3 position by an amino, C_{1-3}-alkylamino, di (C_{1-3}-alkyl) amino or 5- to 7-membered cycloalkyleneimino~~

~~group, while in each case an alkyl moiety in the abovementioned alkylamino and dialkylamino groups may additionally be substituted by a phenyl group, a trifluoromethyl, nitro, amino, C_{1-3}-alkylamino, di-(C_{1-3}-alkyl)-amino, C_{2-5}-alkanoylamino, N-(C_{1-3}-alkyl)-C_{2-5}-alkanoylamino, C_{1-5}-alkylsulphonylamino, N-(C_{1-3}-alkyl)-C_{1-5}-alkylsulphonylamino, phenylsulphonylamino, N-(C_{1-3}-alkyl)-phenylsulphonylamino, aminosulphonyl, C_{1-3}-alkylaminosulphonyl or di-(C_{1-3}-alkyl)-aminosulphonyl group, while in each case an alkyl moiety in the abovementioned alkylamino and dialkylamino groups may additionally be substituted by a carboxy, C_{1-3}-alkoxycarbonyl, aminocarbonyl, C_{1-3}-alkylaminocarbonyl, di-(C_{1-3}-alkyl)-aminocarbonyl, 2-dimethylaminoethylaminocarbonyl or N-methyl-(2-dimethylaminoethyl)-aminocarbonyl group and in each case the alkyl moiety of the abovementioned alkanoylamino or alkysulphonylamino groups may additionally be substituted by a phenyl, amino, C_{1-3}-alkylamino, di-(C_{1-3}-alkyl)-amino or a 4- to 7-membered cycloalkyleneimino group,~~

~~a C_{2-4}-alkylamino group which is terminally substituted in the 2-, 3- or 4-position by an amino, C_{1-3}-alkylamino, di-(C_{1-3}-alkyl)-amino, benzylamino, N-(C_{1-3}-alkyl)-benzylamino, C_{2-5}-alkanoylamino or N-(C_{1-3}-alkyl)-C_{2-5}-alkanoylamino group and wherein additionally the amino-hydrogen atom may be replaced by a C_{2-5}-alkanoyl, benzoyl, C_{1-5}-alkylsulphonyl- or phenylsulphonyl group, while the last-mentioned C_{2-5}-alkanoyl or C_{1-5}-alkylsulphonyl groups in the alkyl moiety may be substituted by a phenyl group,~~

~~a carbonyl group which is substituted by a hydroxy, C_{1-3}-alkoxy, amino, C_{1-3}-alkylamino, N-(C_{1-5}-alkyl)-C_{1-3}-alkylamino or C_{5-7}-cycloalkyleneimino group;~~

~~a C_{1-3}-alkyl group which may be substituted by an amino, C_{1-5}-alkylamino, C_{5-7}-cycloalkylamino or phenyl-C_{1-3}-alkylamino group which may additionally be substituted at the amino nitrogen atom in each case by a C_{1-4}-alkyl, C_{5-7}-cycloalkyl or C_{2-4}-alkenyl- or C_{1-4}-alkyl group, while~~

~~the abovementioned C_{1-4}-alkyl substituent in each case may additionally be mono-, di- or trisubstituted by a cyano, carboxy, C_{1-3}-alkoxycarbonyl, C_{2-4}-alkanoyl, pyridyl, imidazolyl, benzo[1,3]dioxol or phenyl group, while the phenyl group may be substituted by fluorine, chlorine or bromine atoms, by methyl, methoxy, trifluoromethyl, cyano or nitro groups and the substituents may be identical or different, or in the 2-, 3- or 4-position by a hydroxy group,~~

a C_{1-3}-alkyl group which is substituted by a ~~hydroxy, carboxy, morpholino, thiomorpholino, 1-oxo-thiomorpholino, 1,1-dioxo-thiomorpholino, piperazino, N-(C_{1-3}-alkyl) piperazino or N-benzyl-piperazino group, by a 5- to 7-membered cycloalkenyleneimino group or by a 4- to 7-membered cycloalkyleneimino~~ piperidino group, while the abovementioned ~~5- to 7-membered cycloalkyleneimino groups~~ piperidino group may be substituted by one or two C_{1-3}-alkyl groups, which may in turn be terminally substituted by a hydroxy, amino or C_{2-4}-alkanoylamino group, or by a C_{5-7}-cycloalkyl or phenyl group and by a hydroxy group and in the abovementioned ~~cycloalkyleneimino groups~~ piperidino group a methylene group adjacent to the nitrogen atom may be replaced by a carbonyl group~~,~~

~~a C_{1-3}-alkyl group which is substituted by a 5- to 7-membered cycloalkyleneimino group, while a phenyl group optionally mono- or disubstituted by fluorine, chlorine or bromine atoms or by methyl or methoxy groups, wherein the substituents may be identical or different, or an oxazolo, imidazolo, thiazolo, pyridino, pyrazino or pyrimidino group optionally substituted by a fluorine, chlorine, bromine or iodine atom, by a methyl, methoxy or amino group is fused to the abovementioned 5- to 7-membered cycloalkyleneimino groups via 2 adjacent carbon atoms, while the abovementioned monosubstituted phenyl groups may additionally be substituted by a fluorine, chlorine or bromine atom, by a methyl, methoxy or nitro group, or~~

~~is an imidazolyl or 1H-C_{1-3}-alkylimidazolyl group~~.

Claim 2 (original): A compound of formula I according to claim 1 wherein the sulphonylamino group of the formula R_2-SO_2NR_6- is linked to the 5-position of the indolinone group.

Claim 3 (original): A compound of formula I according to claim 1, wherein:

R_3 is a phenyl group optionally substituted by a fluorine, chlorine or bromine atom, by a C_{1-3}-alkyl, hydroxy, C_{1-3}-alkoxy, C_{1-3}-alkylsulphenyl, C_{1-3}-alkylsulphinyl, C_{1-3}-alkylsulphonyl,

phenylsulphenyl, phenylsulphinyl, phenylsulphonyl, nitro, amino, C_{1-3}-alkylamino, di-(C_{1-3}-alkyl)-amino, C_{2-5}-alkanoylamino or N-(C_{1-3}-alkylamino)-C_{2-5}-alkanoylamino group.

Claim 4 (canceled)

Claim 5 (currently amended): A compound of formula I according to claim 1, wherein:

X is an oxygen atom,

R_1 is a hydrogen atom,

R_2 is a pyridinyl group, ~~C_{1-3}-alkyl group optionally substituted by one or more fluorine atoms or a phenyl group or a C_{2-4}-alkenyl group optionally substituted by a phenyl group; a phenyl group which may be mono- or disubstituted by fluorine, chlorine, bromine or iodine atoms, by C_{1-3}-alkyl or C_{1-3}-alkoxy groups, wherein the substituents may be identical or different,~~

~~a phenyl group substituted by a trifluoromethyl, carboxy, C_{1-3}-alkoxycarbonyl, aminocarbonyl, cyano, aminomethyl, nitro or amino group, or~~

~~a C_{4-6}-alkyl, C_{3-7}-cycloalkyl, trimethylphenyl or naphthyl group, or~~

~~a pyridinyl, quinolyl, isoquinolyl, oxazolyl, isoxazolyl, imidazolyl or 1-(C_{1-3}-alkyl)-imidazolyl group optionally substituted by a C_{1-3}-alkyl group,~~

R_3 is a hydrogen atom or a C_{1-4}-alkyl group, or

a phenyl group optionally substituted by a fluorine, chlorine, bromine or iodine atom, by a C_{1-3}-alkyl, C_{1-3}-alkoxy, nitro or amino group,

R_4 is a phenyl group ~~optionally~~ substituted by R_7,

R_5 and R_6 in each case denote a hydrogen atom, and

R_7 is a ~~fluorine, chlorine, bromine or iodine atom,~~

~~a methoxy, nitro, cyano, carboxy, C_{1-3}-alkoxycarbonyl, aminocarbonyl, C_{1-3}-alkylaminocarbonyl, di-(C_{1-3}-alkyl)-aminocarbonyl, phenyl-C_{1-3}-alkylaminocarbonyl, N-(phenyl-C_{1-3}-alkyl)-C_{1-3}-alkylaminocarbonyl or 5- to 7-membered cycloalkyleneiminocarbonyl group,~~

a C_{1-3}-alkyl group which is substituted by a ~~carboxy, C_{1-3}-alkoxycarbonyl, aminocarbonyl, C_{1-3}-alkylaminocarbonyl, di-(C_{1-3}-alkyl)-aminocarbonyl, phenyl-C_{1-3}-alkylaminocarbonyl, N-(phenyl-C_{1-3}-alkyl)-C_{1-3}-alkylaminocarbonyl, 5- to 7-membered cycloalkyleneiminocarbonyl, amino, C_{1-3}-alkylamino, di-(C_{1-3}-alkyl)-amino, phenyl-C_{1-3}-alkylamino, N-(phenyl-C_{1-3}-alkyl)-C_{1-3}-alkylamino or 5- to 7-membered cycloalkyleneimino~~ piperidino group,
while the abovementioned ~~5- to 7-membered cycloalkyleneimino~~ piperidino group may be substituted by one or two C_{1-3}-alkyl groups, which may in turn be terminally substituted by a hydroxy, amino or C_{2-4}-alkanoylamino group, and at the same time in the abovementioned piperidino group ~~5- to 7-membered cycloalkyleneimino moieties~~ a methylene group in the 2 position may be replaced by a carbonyl group ~~or in the abovementioned 6- and 7-membered cycloalkyleneimino moieties a methylene group in the 4 position may be replaced by an oxygen atom, by an imino, N-(C_{1-3}-alkyl)-imino, N-(phenyl-C_{1-3}-alkyl)-imino or N-(C_{1-5}-alkoxycarbonyl)-imino group,~~
~~an amino, C_{1-3}-alkylamino, phenyl-C_{1-3}-alkylamino, C_{1-5}-alkanoylamino, phenyl-C_{1-4}-alkanoylamino, C_{1-5}-alkoxycarbonylamino, phenyl-C_{1-3}-alkoxycarbonylamino, C_{1-5}-alkylsulphonylamino, phenyl-C_{1-3}-alkylsulphonylamino- or phenylsulphonylamino group, wherein the hydrogen atom of the amino group may be replaced by a C_{1-3}-alkyl group, while the C_{1-3}-alkyl moiety may be substituted by a carboxy, C_{1-3}-alkoxycarbonyl, aminocarbonyl, C_{1-3}-alkylaminocarbonyl, di-(C_{1-3}-alkyl)-aminocarbonyl, phenyl-C_{1-3}-alkylaminocarbonyl, N-(phenyl-C_{1-3}-alkyl)-C_{1-3}-alkylaminocarbonyl, 2-dimethylaminoethylaminocarbonyl, N-methyl-(2-dimethylaminoethyl)-aminocarbonyl- or C_{4-6}-cycoalkylenimnocarbonyl group or from position 2 by an amino, C_{1-3}-alkylamino, di-(C_{1-3}-alkyl)-amino, phenyl-C_{1-3}-alkylamino, N-(phenyl-C_{1-3}-alkyl)-C_{1-3}-alkylamino, C_{2-5}-alkanoylamino, N-(C_{1-3}-alkyl)-C_{2-5}-alkanoylamino, C_{1-5}-alkoxycarbonylamino- or N-(C_{1-5}-alkoxycarbonyl)-C_{1-3}-alkylamino group~~.

Claim 6 (currently amended): A compound of formula I according to claim 1, wherein:

R_2 is a pyridinyl group, ~~C_{1-3}-alkyl group optionally substituted by a phenyl group, a C_{1-3}-perfluoroalkyl group or a phenylvinyl group,~~ or
~~a phenyl group which may be substituted by a fluorine, chlorine, bromine or iodine atom, by a C_{1-3}-alkyl, C_{1-3}-alkoxy, nitro, amino, cyano, cyanomethyl or aminomethyl group,~~
~~a C_{4-6}-alkyl, C_{3-7}-cycloalkyl, trimethylphenyl or naphthyl group,~~
~~a pyridinyl, quinolyl, isoquinolyl, oxazolyl, isoxazolyl, imidazolyl or 1-(C_{1-3}-alkyl)-imidazolyl group optionally substituted by a C_{1-3}-alkyl group,~~

R_3 is a phenyl group optionally substituted by a fluorine, chlorine, bromine or iodine atom, by a C_{1-3}-alkyl, C_{1-3}-alkoxy, nitro or amino group,

R_4 is a phenyl group which ~~may be~~ is substituted byR_7 and additionally by a chlorine atom or a nitro group, while

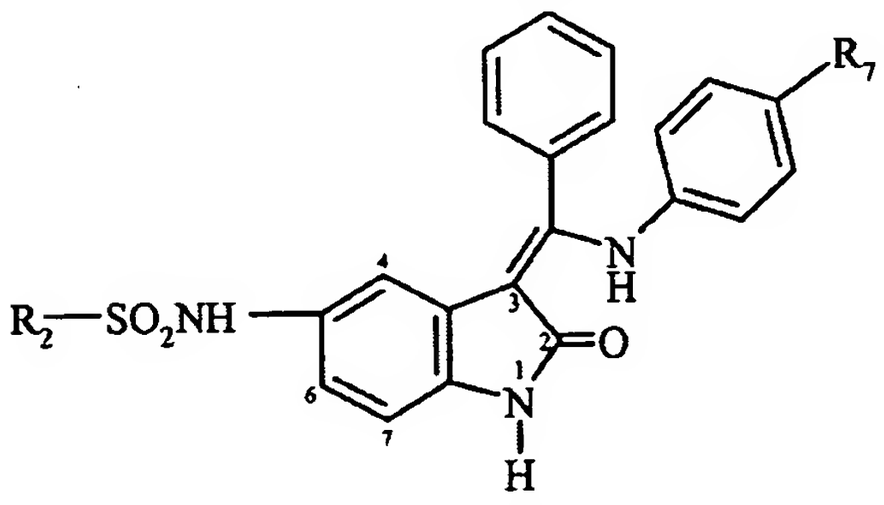
R_7 is ~~a fluorine, chlorine, bromine or iodine atom,~~
~~a methoxy, nitro, cyano, carboxy, methoxycarbonyl, aminocarbonyl, methylaminocarbonyl, dimethylaminocarbonyl, benzylaminocarbonyl, N-benzyl-methylaminocarbonyl, pyrrolidinocarbonyl or piperidinocarbonyl group,~~
a methyl or ethyl group which ~~may be~~ is substituted by a ~~carboxy, methoxycarbonyl, aminocarbonyl, methylaminocarbonyl, dimethylaminocarbonyl, benzylaminocarbonyl, N-benzyl-methylaminocarbonyl, pyrrolidinocarbonyl, piperidinocarbonyl, amino, methylamino, dimethylamino, benzylamino, N-benzylmethylamino, C_{2-4}-alkanoylamino, N-methyl-C_{2-4}-alkanoylamino, tert.butyloxycarbonylamino, N-methyl-tert.butyloxycarbonylamino, pyrrolidino, pyrrolidinomethyl, hydroxypyrrolidinomethyl, hydroxymethylpyrrolidinomethyl,~~ piperidino~~, dimethylpiperidino, 2-oxo-piperidino, piperazino, 4-methyl-piperazino, 4-benzyl-piperazino, 4-tert.butoxycarbonyl-piperazino or morpholino~~ group~~, or~~
~~an amino, methylamino, ethylamino, C_{1-3}-alkanoylamino, phenylacetylamino, tert.butoxycarbonylamino, C_{1-4}-alkylsulphonylamino, phenyl-methylsulphonylamino or phenylsulphonylamino group, wherein the hydrogen atom of the amino group may be replaced by a methyl or ethyl group, while the methyl or ethyl moiety in each case may be substituted by a carboxy, methoxycarbonyl, aminocarbonyl, methylaminocarbonyl or dimethylaminocarbonyl group or the ethyl moiety may also be substituted from position 2 by~~

~~an amino, methylamino, dimethylamino, benzylalkylamino, N-benzyl-methylamino, C_{3-5}-alkanoylamino, N-methyl-C_{3-5}-alkanoylamino, tert.butyloxycarbonylamino or N-methyl-tert.butyloxycarbonylamino group~~.

Claim 7 (original): A compound of formula I according to claim 1, wherein R_4 is a phenyl group substituted in the 4 position by R_7.

Claims 8 and 9 (canceled)

Claim 10 (original): A compound of formula IB



(IB),

wherein R_2 and R_7 are defined as in claim 1, 4, 5or 6.

Claim 11 (currently amended): A compound of formula IB according to claim 10 wherein:

R_7 is selected from the group consisting of:

~~hydrogen,~~ (2,6-dimethylpiperidino)-methyl and~~, (N-ethylsulphonyl) N-(2-dimethylaminoethyl) aminocarbonylmethyl) amino, N-ethylsulphonyl N-(N-(2-dimethylaminoethyl) N-methyl-amino-carbonylmethyl) amino,~~ 2-oxopiperidinomethyl~~, 4-benzyl piperazino-methyl, 4-methylpiperazino-methyl, 4-tert.butoxycarbonyl-piperazinomethyl, acetylamino, acetylaminomethyl, amino, aminomethyl, benzylaminocarbonyl, benzylaminocarbonyl-methyl, carboxy, carboxymethyl, chlorine, cyano, dimethylaminocarbonyl-methylamino, dimethylaminoethyl, dimethylaminomethyl, ethoxycarbonylmethyl, ethylsulphonylamino, formylamino, methoxycarbonyl, methylsulphonylamino, morpholinomethyl, N-(2-(N-acetyl-N-methyl-amino)-ethyl)-ethylsulphonylamino, N-(2-(N-acetyl-N-methyl-amino)-ethyl)-methylsulphonylamino, N-(2-(N-acetyl-N-methyl-amino)-ethyl)-propionylamino, N-(2-(N-acetyl-N-methyl-amino)-ethylamino, N-(2-(N-benzyl-N-methyl-amino)-ethyl)-propionylamino, N-(2-acetylamino-ethyl)-N-acetyl-amino, N-(2-acetylamino-ethyl)-N-ethylsulphonyl-amino, N-(2-acetylamino-ethyl)-N-methylsulphonyl-amino, N-(2-acetylamino-ethyl)-N-propionyl-amino, N-(2-aminoethyl)-N-methylsulphonyl-amino, N-(2-dimethylamino-ethyl)-N-acetyl-amino, N-(2-dimethylamino-ethyl)-N-butylsulphonyl-amino, N-(2-dimethylamino-ethyl)-N-methylsulphonyl-amino, N-(2-dimethylamino-ethyl)-N-phenylsulphonyl-amino, N-(2-dimethylaminoethyl)-N-propylsulphonyl-amino, N-(2-methylamino-ethyl)-acetylamino, N-(2-methylamino-ethyl)-N-methylsulphonyl-amino, N-(2-methylamino-ethyl)-propionylamino, N-(2-propionylamino-ethyl)-N-propionyl-amino, N-(aminocarbonyl-methyl)-N-methylsulphonyl-amino, N-(dimethylamino-carbonylmethyl)-N-(methylsulphonyl-amino, N-(dimethylaminoethyl)-N-methylsulphonyl-amino, N-(methylaminocarbonyl-methyl)-N-methylsulphonyl-amino, N-(piperidinomethyl-carbonyl)-N-methyl-amino, N-acetyl-N-(2-(N-benzyl-N-methyl-amino)-ethylamino, N-acetyl-N-(2-benzyl-oxycarbonylamino-ethyl)-amino, N-carboxylmethyl-N-methylsulphonyl-amino, N-ethylsulphonyl-N-hydroxycarbonylmethyl-amino, N-methyl-N-acetyl-amino, N-methyl-N-ethylsulphonyl-amino, N-methyl-N-formyl-amino, N-methyl-N-methylsulphonyl-amino, N-methyl-N-propionyl-amino, piperazinomethyl, propionylamino, pyrrolidin-1-yl-methyl, 2-

~~hydroxymethylpyrrolidin-1-yl-methyl, 3-hydroxypyrrolidin-1-yl-methyl and tert.butoxycarbonylamino~~; and

R_2 is pyrid-2-yl or pyrid-3-yl ~~selected from the group consisting of: 1-methyl-1H-imidazol-4-yl, 2-aminophenyl, 2-chlorophenyl, 2-cyanophenyl, 2-nitrophenyl, 2-phenylethene, 3-aminomethylphenyl, 3-aminophenyl, 3-chlorophenyl, 3-cyanophenyl, 3-methoxyphenyl, 3-methylphenyl, 3-nitrophenyl, 4-aminophenyl, 4-chlorophenyl, 4-methoxyphenyl, 4-methylphenyl, 4-nitrophenyl, benzyl, quinolin-8-yl, cyclopropyl, ethyl, isopropyl, methyl, naphthalin-1-yl, naphthalin-2-yl, propyl, pyrid-2-yl, pyrid-3-yl, 3,5-dimethyl-isoxazol-4-yl and 2,4,6-trimethylphenyl~~.

Claim 12 (canceled)

Claim 13 (currently amended): A pharmaceutical preparation comprising a compound according to claim 1, 2, 3, 4, 5, 6, 7~~, 8, 9, 10, 11~~ or ~~12~~ 15 and a pharmaceutically acceptable carrier.

Claim 14 (withdrawn): A method for treating a disease characterised by excessive or abnormal cell proliferation which comprises administering a therapeutic amount of a compound according to claim 1, 2, 3, 4, 5, 6, 7~~, 8, 9, 10, 11~~ or ~~12~~ 15.

Claim 15 (new): (Z)-3-{1-[4-(piperidinomethyl)-phenylamino]-1-phenyl-methylidene}-5-(pyridin-3-ylsulphonylamino)-2-indolinone, or a pharmaceutically acceptable salt thereof.